PROJECT NUMBER: 1759
PROJECT TITLE: Materials Evaluation and Elemental Analysis
PROJECT LEADER: P. F. Grantham
PERIOD COVERED: May, 1990

I. MATERIALS EVALUATION

A. **Objective:** To identify components of commercial products prior to their use at PM facilities.

B. **Results:** Routine analysis of commercial products, Packaging Development, and TTG samples continue. The Materials Evaluation Committee conducted audits at MC Primary and at 20th Street. Several foreign matter and customer complaint samples were analyzed this month.

C. **Plans:** Analyses of samples are on-going. Presentations will be made upon request. Audits will be made as scheduled.

II. ELEMENTAL ANALYSIS

A. **Objective:** To provide qualitative and quantitative elemental data on tobacco, cigarette paper, development and materials evaluation samples.

B. **Results:**

The X-ray Fluorescence (XRF) method for screening selected elements in packaging material has been used to screen approximately twenty samples associated with the Marlboro Brand. Samples will continue to be analyzed as they are received from Incoming Materials QA.

A potentiomentric titration assay was used to determine % Menthylchloroformate in three production samples of menthol release compounds.

Samples of Vanil-3 and Glucosementhylcarbonate (GMC) were analyzed using an ion-selective electrode to determine if fluoride was present. No fluoride was detected in either sample. The GMC sample was also analyzed to determine chloride concentration using an ion-selective electrode. Duplicate runs of the sample yielded approximately 700µg/g chloride.

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Differential Scanning Calorimetry (DSC) was used to determine the specific heat capacity of a control PVA adhesive and a PVA adhesive containing 5% CR-2910, a flavor release compound. The control sample showed a gradual increase in specific heat capacity between 23°C and 55°C. This is most likely due to the contribution of the heat of vaporization of low boiling volatiles present in the adhesive. The sample containing 5% CR-2910 showed very little variation over the temperature range.

Thermogravimetric/Differential Thermal Analysis (TG/DTA) was used to analyze samples of hydromagnesite, hydrotalcite, magnesium hydroxide, and potassium succinate. All samples were heated from ambient temperature to 1000°C at rates of 10° or 20° per minute. The samples of hydrotalcite showed multiple endothermic transitions over the temperature range. The magnesium hydroxide samples varied. One sample showed a single endothermic transition at 330°C, another had a single transition at 378°C and a third showed multiple transitions at 327°C and 367°C. The single potassium succinate sample gave endothermic transitions at 58°C, 252°C and 891°C. Thermogravimetry showed total weight loss for the potassium succinate, indicating complete volatilization of the sample.

C. Plans: Support for R&D projects for elemental analysis will continue.

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